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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/812,997	03/21/2001	Minoru Yamada	109016	3891

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EXAMINER	
BATTAGLIA, MICHAEL V	
ART UNIT	**PAPER NUMBER**
2652	18

DATE MAILED: 06/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/812,997	YAMADA ET AL.	
	Examiner	Art Unit	
	Michael V Battaglia	2652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 March 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This action, dated June 7, 2004, is in response to Applicant's amendment, filed May 17, 2004. Claims 1-12 are pending.

Claim Rejections - 35 USC § 103

1. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itaya et al (hereafter Itaya) (US 5,343,486) in view of Thronton et al (hereafter Thronton) (US 6,574,257).

In regard to claim 1, Itaya discloses a semiconductor device to be used in a high-density optical disc system (Col. 1, lines 13-15) comprising: a distributed feedback laser (Col. 7, lines 53-56) including first (Fig. 5, element 57) and second (Fig. 5, element 53) cladding layers, an active layer (Fig. 5, element 54) sandwiched between said first and second cladding layers, a first reflecting member (Fig. 5, elements 55 and 56) having a periodic wave-shaped structure formed within said first cladding layer at an interface between said active layer and said first cladding layer or in close proximity to said active layer, a third reflecting member (Fig. 5, element 63) provided on a second end surface of said assembly, and first and second current injection electrodes (Fig. 5, elements 61-62) electrically connected to said first and second cladding layers, respectively; and an injection current source connected to said first and second current injection electrodes (Col. 12, line 9). It is noted that there are two electrodes and that the definition of an electrode is a solid electric conductor through which an electric current enters or leaves an electrolytic cell or other medium (*The American Heritage® Dictionary of the English Language, Fourth Edition*). Therefore, the injection current source would inherently be connected to the electrodes so that current would enter through one electrode and current would leave through the other electrode. It is further noted that the first and second optical guides (Fig. 5, elements 55 and 56) are

interpreted as the first reflecting member and will have a reflecting property due to their periodic wave-shaped structure. Itaya does not disclose that the semiconductor device to be used in a high-density optical disc system is a near-field optical head or that a second reflecting member is provided on a first end surface of an assembly of said first and second cladding layer and active layer that has an exit window formed by a fine aperture; whereby laser light emitted from said exit window of the distributed feedback laser is made incident upon an optical record medium arranged in a near-field.

Thronton discloses a second reflecting member (Fig. 1, elements 28-30) provided on a first end surface of an assembly (Fig. 1, element 16) having an exit window formed by a fine aperture (Fig. 1, element 32); whereby laser light emitted from said exit window of the distributed feedback laser is made incident upon an optical record medium arranged in a near-field (Col. 1, lines 8-10). Thronton teaches that use of an exit window formed by a fine aperture enables a semiconductor device to be used in a near-field optical head by restricting the emitted beam to the size of the exit window, thereby reducing the size of the laser beam spot formed on an optical disc in the near-field and increasing the amount of data that can be recorded to and reproduced from the optical disc (Col. 1, line 64 - Col. 2, line 9 and Col. 6, lines 40-43).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide on the first end surface of the assembly of the first and second cladding layers and the active layer of Itaya the second reflecting member having an exit window formed by a fine aperture of Thronton and to emit laser light from the exit window upon an optical record medium arranged in a near-field as suggested by Thronton, the motivation being to enable a semiconductor device to operate as a near-field optical head that will increase the amount of data that can be recorded to and reproduced from an optical disc.

In regard to claim 2, Itaya discloses that the said periodic wave-shaped structure of the first reflecting member has a smooth wave configuration (Fig. 5, element 56).

In regard to claim 3, Thronton discloses that the said second reflecting member includes a dielectric film (Fig. 1, elements 28-29) provided on the first end surface of the assembly of the first and second cladding layers and active layer (Fig. 1, element 16), and a metal film formed on the dielectric film and having formed therein said fine aperture constituting said exit window (Fig. 1, element 30).

In regard to claim 4, Itaya discloses that the said third reflecting member is formed by multiple dielectric films (Fig. 5, element 63; Col. 4, lines 33-36 and 52-53; and Col. 8, lines 1-2).

In regard to claims 5, 7, and 10, Itaya in view of Thronton discloses the near-field optical head of claim 1. Itaya in view of Thronton as applied to claim 1, does not disclose that the near-field optical head is constructed as a recording and reproducing optical head for recording information on the optical record medium and reproducing the information from the optical record medium.

Thronton discloses that the near-field optical head is constructed as a recording and reproducing optical head for recording information on the optical record medium and reproducing the information from the optical record medium (Col. 1, lines 8-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct the near-field optical head of Itaya in view of Thronton as applied to claim 1 as a recording and reproducing optical head for recording information on the optical record medium and reproducing the information from the optical record medium as suggested by Thronton, the motivation being to read and write information from and to an optical record medium arranged in the near-field.

In regard to claim 6, Thronton discloses that a current injected into the distributed feedback laser by means of said first and second current injection electrodes from said injection current source is modulated in accordance with information to be recorded on the optical record medium and near-field laser light having modulated intensity is made incident upon the optical record medium to cause a thermal change in a material of the optical record medium (Col. 3, line 64 - Col. 4, line 2 and Col. 6, lines 29-51).

In regard to claim 8, Thronton discloses that a constant current is injected into the distributed feedback laser from said injection current source to produce near-field laser light having a constant intensity (Col. 7, lines 34-59), the thus produced near-field laser light is made incident upon the optical record medium through said exit window (Col. 5, lines 25-26), laser light reflected by the optical record medium is returned into the distributed feedback laser through said exit window, and a voltage change appearing across said first and second current injection electrodes is detected to produce a reproduced signal representing the information recorded on the optical record medium (Fig. 1, element 38; Fig. 2; Col. 5, lines 46-65, and Col. 7, lines 34-59).

In regard to claim 9, Thronton discloses that a constant current is injected into the distributed feedback laser to produce near-field laser light having a constant intensity (Col. 7, lines 34-59), the thus produced near-field laser light having a constant intensity is made incident upon the optical record medium, and laser light reflected by the optical record medium is returned into the distributed feedback laser by means of the exit window and is amplified therein; whereby the near-field optical head further comprises a photodetector for receiving laser light emanating from said third reflecting member to produce a reproduction signal representing the information recorded on the optical record medium (Fig. 1, element 44; Col. 5, line 66 - Col. 6, line 5; and Col. 7, lines 34-59). The examiner notes that the reflectance of the Thronton's rear facet (Fig. 1,

element 18) has a high reflectance (Table 1), which is similar to the reflectance of the third reflecting member of Itaya (Fig. 5, element 63).

In regard to claim 11, Thronton discloses that upon recording the information on the optical record medium, a current injected into the distributed feedback laser by means of said first and second current injection electrodes from said injection current source is modulated in accordance with information to be recorded on the optical record medium, and near-field laser light having modulated intensity is made incident upon the optical record medium to cause a thermal change in a material of the optical record medium (Col. 3, line 64 - Col. 4, line 2 and Col. 6, lines 29-51); and upon reproducing the information from the optical record medium, a constant current is injected into the distributed feedback laser from said injection current source to produce near-field laser light having a constant intensity (Col. 7, lines 34-59), the thus produced near-field laser light is made incident upon the optical record medium through said exit window (Col. 5, lines 25-26), laser light reflected by the optical record medium is returned into the distributed feedback laser through said exit window, and a voltage change appearing across said first and second current injection electrodes is detected to produce a reproduced signal representing the information recorded on the optical record medium (Fig. 1, element 38; Fig. 2; Col. 5, lines 46-65, and Col. 7, lines 34-59).

In regard to claim 12, Thronton discloses that the near-field optical head further comprises a photodetector (Fig. 1, element 44); and upon recording the information on the optical record medium, a current injected into the distributed feedback laser by means of said first and second current injection electrodes from said injection current source is modulated in accordance with information to be recorded on the optical record medium, and near-field laser light having modulated intensity is made incident upon the optical record medium to cause a thermal change

in a material of the optical record medium (Col. 3, line 64 - Col. 4, line 2 and Col. 6, lines 29-51); and upon reproducing the information from the optical record medium, a constant current is injected into the distributed feedback laser to produce near-field laser light having a constant intensity (Col. 7, lines 34-59), the thus produced near-field laser light having a constant intensity is made incident upon the optical record medium, laser light reflected by the optical record medium is returned into the distributed feedback laser by means of the exit window and is amplified therein, and laser light emanating from said third reflecting member is detected by said photodetector to produce a reproduction signal representing the information recorded on the optical record medium (Fig. 1, element 44; Col. 5, line 66 - Col. 6, line 5; and Col. 7, lines 34-59). The examiner notes that the reflectance of the Thronton's rear facet (Fig. 1, element 18) has a high reflectance (Table 1), which is similar to the reflectance of the third reflecting member of Itaya (Fig. 5, element 63).

Response to Arguments

Applicant's arguments filed May 12, 2004 have been fully considered but they are not persuasive. In response to Applicant's argument that Itaya's front facet has a low reflectance of 20% and that Thronton does not suggest using the second reflective layer having an exit window formed by a fine aperture in place of or with a front facet having a low reflectance, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the suggestion is in the

references themselves. Itaya discloses a semiconductor device that emits light. Thronton suggests using a second reflective layer having an exit window formed by a fine aperture with a semiconductor device that emits light and teaches that use of an exit window formed by a fine aperture enables a semiconductor device to be used in a near-field optical head by restricting the emitted beam to the size of the exit window, thereby reducing the size of the laser beam spot formed on an optical disc in the near-field and increasing the amount of data that can be recorded to and reproduced from the optical disc (Col. 1, line 64 - Col. 2, line 9 and Col. 6, lines 40-43). One of ordinary skill in the art would have been motivated to combine the references improve the light produced by the semiconductor device of Itaya as suggested by Thronton regardless of the reflectance of the front facet of Itaya. It is further noted that the second reflecting layer of Thronton that has an exit window formed by a fine aperture is simply added to the front facet of the semiconductor device of Itaya to meet the limitations of claim 1. The second reflecting layer of Thronton does not replace any part of the semiconductor device of Itaya. As a result, the laser light emitted from the active layer of the semiconductor device of Itaya and through the fine aperture of Thronton must still pass through the low reflectance front facet of Itaya.

Conclusion

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael V Battaglia whose telephone number is (703) 305-4534. The examiner can normally be reached on 5-4/9 Plan with 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M. Battaglia

Michael Battaglia

W. R. YOUNG
PRIMARY EXAMINER